

RECEIVED
CENTRAL FAX CENTER

NOV 02 2006

AMENDMENT TO THE DRAWINGS

Please add new Figure 3 which is being filed herewith. As noted in the remarks section below, the new figure is supported by the description and the claims of the application as originally filed.

IN THE DRAWINGS

Please add new Figure 3:

REMARKS

The Examiner's careful review and examination of the subject application are noted and appreciated. Applicants have carefully reviewed the above-identified Office Action. Applicants submit that, in view of the amendments and clarifying remarks set forth herein, all bases of objection and rejection have been overcome. Accordingly, Applicants respectfully request withdrawal of the pending rejections and allowance of the claims submitted.

1. Objection to Drawings under 37 CFR §1.83(a)

The PTO has objected to the drawings under 37 CFR 1.83(a). Applicants have added new Figure 3, which depicts the claimed hydrogen storage system 20, that includes a hydrogen source 24, a valve 10, and a pressure containment vessel 20. Further, Applicants have added two new paragraphs to the specification describing Figure 3. No new matter has been added as support for the drawing and the amended specification can be found in original claim 5, and on page 2, paragraph [0013] of the original Specification.

Applicants respectfully submit that the drawings now show every feature of the invention specified in the claims per the requirements of 37 CFR 1.83(a). Therefore, Applicants respectfully request the removal of the objection.

2. Rejection of the Claims 1, 3-6, 8 and 9 under 35 U.S.C. § 112

The PTO has rejected claims 1, 3-6, 8 and 9 under 35 USC § 112 as failing to comply with the written description requirement. The PTO has stated that the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one

skilled in the relevant art that the inventor(s), at the time the application was filed had possession of the claimed invention. The Applicants' representative disagrees with the PTO. However, Applicants' representative respectfully submits that the PTO's rejection is moot in light of the amendment to claims 1 and 5. In particular, claims 1 and 5 no longer recite that "each of said longitudinal flow channels allowing continuous flow through said plug regardless of the position of the plug". Therefore, removal of the rejection is respectfully submitted.

3. New and Amended Claims

Applicants have amended claim 1 to include "said valve regulating the flow of hydrogen gas at said one or more exit ports." No new matter has been added with this amendment as support can be found in Figure 1 and on page 2, paragraph 15 of the original specification. Further, new claims 13 and 14, which are dependent on claim 1 and new claims 10-12 which are dependent on claim 5 have been added. No new matter has been added as support for the new claims can be found on page 2, paragraph 15 and in Figure 1 of the original specification.

4. Rejection of the Claims 1, 3, 4 under 35 U.S.C. § 103(a)

Applicants' amended claim 1 requires "said valve regulating the flow of hydrogen gas at the one or more exit ports." Johnson does not teach or suggest this limitation. In Figure 1, Johnson teaches a governor having a casing B, an entrance port connected to conduit A¹ and an exit port connected to conduit A². The governor includes piston-valve C in the proximity of entrance conduit A¹, which extends from enlarged end C¹ to the curved surface defined by recess C³. The casing B in which piston-valve C moves includes cylindrical portion b, inwardly tapered portion b¹, and annular stop b². The governor of Johnson regulates the flow of

motive fluid from entrance conduit A' to exit conduit A² through displacements of piston-valve C that are responsive to changes in the difference in pressure between the opening at exit conduit A² and the opening at entrance conduit A'. When a fluid-pressure motor (e.g. pneumatic drill) that utilizes the governor of Johnson is operated at its designed load, the pressures at entrance conduit A' and exit conduit A² are approximately balanced and piston-valve C is in the open position shown in Figure 1 of Johnson. (See p.2, lines 49-54 of Johnson). When the load on the fluid-pressure motor is reduced, the pressure at exit conduit A² is reduced relative to the pressure at entrance conduit A'. (See p. 2, lines 54-66 of Johnson). This reduction in pressure induces motion of piston-valve C toward exit conduit A². (See p. 2, lines 66-68 of Johnson). The motion of piston-valve C causes enlarged end C' to move through cylindrical portion b of casing B into inwardly tapered portion b'. (See p. 2, lines 69-74 of Johnson). Motion of piston-cylinder C into inwardly tapered portion b' of casing B causes a restriction of the flow of motive fluid due to a narrowing of the passageway through which the fluid can flow. (See p. 2, lines 74-78 of Johnson). Accordingly, the governor of Johnson achieves control of the fluid flow between entrance conduit A' and exit conduit A² by regulating the fluid flow at the entrance side. Applicant's amended claim 1, in contrast, teaches a valve assembly that achieves control of fluid flow between an entrance port and an exit port by regulating the fluid flow at the exit side.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (MPEP 2143)

Since Johnson does not teach or suggest Applicants' required limitation of "said valve regulating the flow of hydrogen gas at the one or more exit ports," Johnson does not teach or suggest each and every claim limitation of Applicants' claimed invention.

Johnson is not directed to a hydrogen storage system, and does not disclose the specific innovative features of Applicants' claimed invention, that makes Applicants' claimed invention advantageous over previous devices for regulating the flow of hydrogen gas in a metal hydride hydrogen storage system. For example, Applicants' claimed valve has a unique plug design for "regulating the flow of a high pressure hydrogen stream," that is, throttling the high pressure source to maintain constant hydrogen flow regardless of the hydrogen source pressure (See page 2, paragraph 13 of Applicants' Specification.) By maintaining constant hydrogen flow, Applicants' valve prevents overheating of the hydrogen storage material. In contrast, the valve in Johnson is designed for compensating for drop-offs in pressure on the exit side the valve (See Johnson Page 2, Lines 60-65). The valve in Johnson decreases fluid flow to the engine during these drop-off periods. Therefore, Applicants' claim limitation of "regulating the flow of hydrogen gas at the one or more exit ports," allows for a fundamentally different operation than the valve of Johnson.

Therefore, Applicants' invention is nonobvious over Johnson. Thus, Applicants respectfully request reconsideration and removal of the rejection to pending claims 1, 2, 4 and 5 under 35 USC 103(a) and allowance of new claims 10 and 11.

5. **Rejection of the Claims 5, 6, 8 and 9 under 35 U.S.C. § 103(a)**

The PTO has stated:

It would have been obvious to one of ordinary skill in the art at the invention was made to have provided in Kelley et al. a pressure regulating valve in place of the valve (62) for the purpose of providing regulated flow therethrough with the valve having a simple construction as shown in Johnson.

(Office Action of 02-Aug-2006, page 5)

Applicants' representative respectfully disagrees with the PTO. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (MPEP 2143.01.) The PTO has proposed that "it would have been obvious to one ordinary skill in the art at the time the invention was made to have provided in Kelley et al. a pressure regulating valve in place of the valve 62 for the purpose of providing regulated flow therethrough with the valve having a simple construction as shown in Johnson."

However, in Kelley, valve 62 is disposed between vacuum pump and purge 60, meter 40, and hydride canister 100. Valve 62 appears to route gas flow between each of these three devices. If valve 62 was replaced by the valve disclosed in Johnson, valve 62 would not work for its intended purpose (i.e., would not selectively route gas flow between the vacuum pump, purge 60, meter 40 and hydride canister 100). Thus, Kelley and Johnson cannot be combined to provide Applicants' claimed invention.

Further, the cited combination does not contain the requisite motivation to combine the cited references. Applicants' invention is a self-regulating valve in that the valve can both detect a pressure of the inlet and throttle the hydrogen flow based on the inlet pressure (through the plug position.) The system of Kelley has a pump, diverter valve, a flow meter, and presumably a

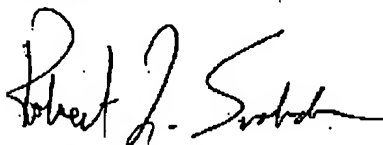
controller. It is unclear to Applicants' representative why one of ordinary skill in the art would place a self-regulating valve in a system that contains a pump, a diverter valve, a flow meter and a controller to control fluid flow level to the hydrogen storage container.

In fact, it appears that the system Kelley contains a problem that Applicants are trying to solve and that the problem would not be solved by placing the valve of Johnson in the system of Kelley. The system of Kelley is used in conjunction with process controls and may be expensive, bulky, complicated, or may not be suitable for certain applications. (See Applicants Specification page 1 paragraph [0006]). The valve of Johnson would not eliminate these process controls.

Thus, Applicants respectfully, submit that Applicants claimed invention of independent claim 5 and all claims dependent thereon is a nonobvious solution to problems in the system of Kelley. Therefore, Applicants' invention is nonobvious over Kelley in view Johnson. Applicants therefore respectfully request pending rejection to claims 5, 6, 8, and 9 be withdrawn and allowance of new claims 10-12.

Applicants respectfully request withdrawal of all outstanding rejections and respectfully submits that the application stands in condition for allowance. If the Examiner has any questions or suggestions regarding this amendment, the Examiner is respectfully asked to contact Applicant's representative at the telephone number or email address listed below.

Respectfully submitted,



Robert J. Svoboda

Reg. No. 58,135

Date: 4 October 2006
Energy Conversion Devices
2956 Waterview Drive
Rochester Hills, MI 48309
Phone: (248) 299-6054
Fax: (248) 844-2273